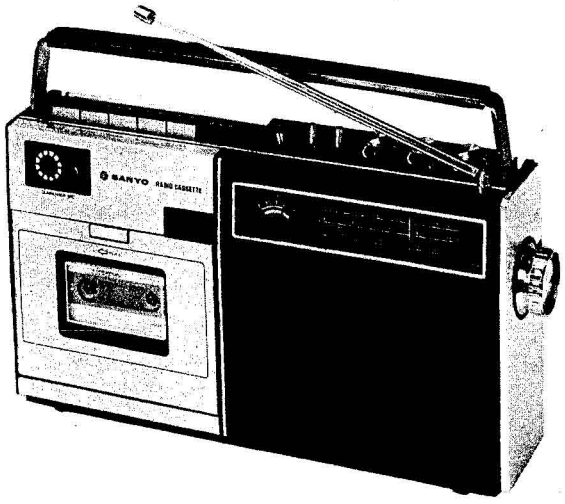
SANYO

SANYO
PORTABLE RADIO
CASSETTE RECORDER
M 2414
SERVICE MANUAL



SPECIFICATIONS

Tape recorder section	
Recording system:	AC bias, double track
Erasing system:	DC erase
Tape speed:	1-7/8 ips. (4.75 cm/sec.)
Recording time:	60 min. (C-60 cassette)
Rewind & Fast forward time:	90 sec. (C-60 cassette)
Frequency response:	50 – 10,000 Hz
Wow & Flutter:	0.3% RMS
Signal to noise ratio:	40 dB
Input:	MIC: 10K ohm
	AUX IN: 120K ohm
Output:	EXT SP: 8 ohm
	LINE OUT: 1K ohm
Radio tuner section	
Frequency range:	FM: 88 – 108 MHz
	SW: 3.2 – 12 MHz
	MW: 530 – 1605 KHz
Sensitivity:	FM: 3μV maximum
	SW: 50μV maximum
General	
IC & FET:	FET 1
Transistors:	18 (tape recorder 11, radio tuner 7)
Diodes:	16 (tape recorder 5, radio tuner 11)
Thermistor:	1
Output power:	3W maximum
Power source:	DC: 6V (UM-2 x 4)
	AC: 120/200/240V
Speaker:	4" (10cm) P.D.S.
Dimentions:	12-7/8"(W) x 3-7/16"(D) x 7-7/8"(H)
	328 x 84 x 200mm
Weight:	6.6 lbs. (3 Kg)

DISASSEMBLY INSTRUCTION

1. Put the set front side down on a soft sheet.
2. Remove the 4 screws on the back lid. (See Fig. 1)
3. To take away the chassis from the cabinet.
   Remove the 6 screws (See Fig. 2), thus you can check the Tuner P.C.B Amplifier, P.C.B etc . . . .
4. To take away the P.C.B from chassis remove the 1 screw (Tapping screw 3 x 10mm) and little slide the chassis to left, then you can check the P.C.B.

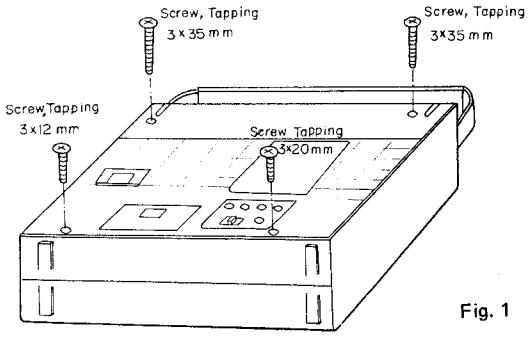


Fig. 1

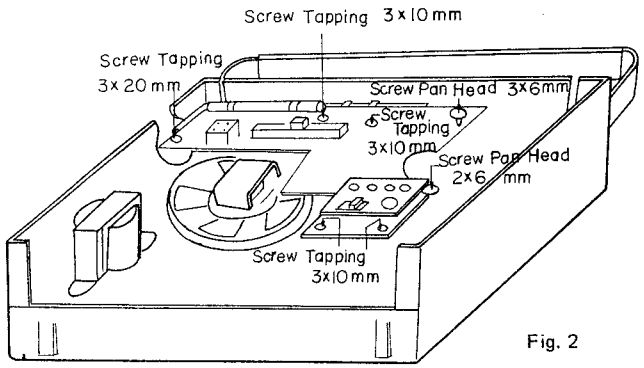


Fig. 2

MECHANICAL ADJUSTMENTS

To measure the torque of the tape recorder, a torque gauge (Fig. 3) and a tension gauge are necessary. To use a tension gauge, make a hole in the side of the Cassette as shown in Fig. 4.
Be careful that the tape does not rub against the edge of the Cassette; these will make correct measurement impossible.

1. TAKE-UP TORQUE (measure with torque gauge)

Play	25 – 40 gr.cm
Fast forward	more than 50 gr.cm
Rewind	more than 50 gr.cm

2. BACK TENSION (measure with tension gauge)

Play	less than 5 gr.cm
Fast forward	less than 5 gr.cm
Rewind	less than 5 gr.cm

3. TAPE TENSION
   As shown in Fig. 5 cut off a length of tape. Tie one end to a thread connected to the tention gauge, and leave the other end hanging loose. Place the recorder in PLAY mode and hold the tention gauge steady (do not move it to left or right).
   When the tape stops, read the tention gauge. If this reading falls more than the range of 250 gr. no adjustment is needed. If it does not fall within this range, adjust the pinch roller pressure. This is done by changing the hole position of the coil spring (141-2-851T-55300) (Fig. 6). Clean the pinch roller (with alchol only) so that the tape will not slip.

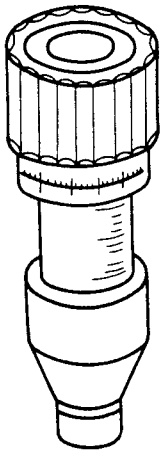


Fig. 3

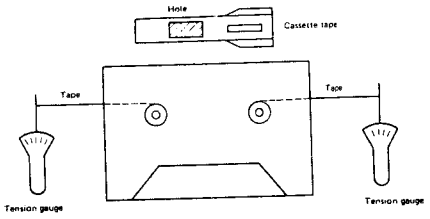


Fig. 4

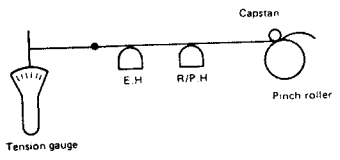


Fig. 5

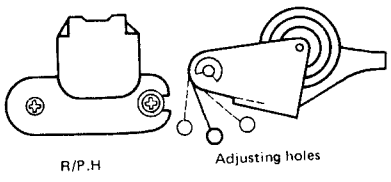


Fig. 6

4. BUTTON PRESSURE

Push the edge of button. When the pressure required to lock each button falls within the range shown below, no adjustment is necessary;

Stop	→ Play	100 – 2800 gr.
Play	→ Stop	less than 1000 gr.
Stop	→ Forward	1000 – 2500 gr.
Stop	→ Rewind	1000 – 2000 gr.
Rewind	→ Stop	less than 1000 gr.
Stop	→ Record	less than 1000 gr.
Record	→ Stop	less than 1000 gr.

If the pressure does not correspond to the above figures adjust the strength of the coil springs (8, 87, 56, 35 & 72) also adjust the force of the coil spring (86) connected to the slide (85).

5. RECORD/PLAY HEAD AZIMUTH ADJUSTMENT

Maximum output and frequency response can be obtained only when the Record/Playback head is correctly aligned for Azimuth alignment rafers the positioning the head in respect to the tape which passes across it during recording and playback. Since the head adjustment screw is set and sealed at the factory, adjustment should not be required unless the screw has been accidently put out of adjustment in the same manner.

If a Record/Playback head becomes defective, it will be necessary to align the now head for correct azimuth after installation.

To do so, proceed as follows;

a. Thread a pre-recorded test tape (cassette type) (6.3 KHz standard frequency tape) into the recorder.
b. Connect an AC VTVM to across the speaker voice coil terminals. To make this connection without removing the recorder from the cabinet, connect an external speaker or a dummy load resistor (same impedance as that of the speaker voice coil) to the MONIT. EXT. SP. terminal.
   NOTE: Set the voltmeter on the 1.5 VAC scale.
c. Depress the PLAY button and turn the tone control knob clockwise until a reading is obtained on the AC voltmeter.
d. Rotate the head adjustment screws clockwise or counterclockwise and continue this procedure until maximum output is obtained as indicated by the AC voltmeter.

6. HEAD DEMAGNETIZATION

Magnetization of the heads may result when the continuity of the head is measured with an ohmmeter. If it is necessary to measure head continuity, the head should be demagnetized after the sontinuity check. Head magnetization is evidenced by a high residual noise (a hissing and low popping sound) when a virgin or completely erased tape is played at a high volume level. The magnetization may be neutralized by use of a standard demagnetization tool. A piece of cellulose tape should be placed over the end of the tool to prevent metal-to-metal contact between the tool and the head. After demagnetization is complete, slowly remove the tool from the vicinity of the head before the current is tuned off.

ELECTRICAL ADJUSTMENT

1. BIAS OSCILLATOR FREQUENCY

As shown in Fig. 7, connect a 10 ohm resistor in series with the ground lead wire of the Record/Playback head. Connect the vertical input of the oscilloscope across the resistor; connect the horizontal input of the oscilloscope to the output terminal of an Audio Frequency Oscillator (AF Oscillator). Beat cancel SW to 1. With the switch set to RECORD mode and connected as above, a lissajous figure will appear on the oscilloscope. Standard frequency is 34 KHz ± 5 KHz. If the frequency is not within the above range, change the oscillator coil or C131 (1500pF). When beat cancel SW is 2 position, standard frequency is 32 kHz.

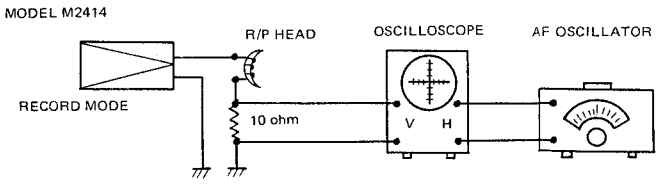


Fig. 7

2. HEAD BIAS CURRENT

Proper bias is necessary for optimum recording. Adjust the bias oscillator frequency as described above. Bias current during recording is measured at both end of inserted (R103) 10 ohm resistor between R/P head and ground (See Fig. 8).

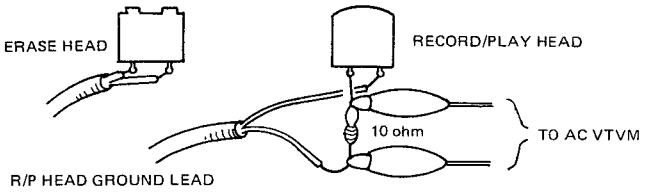
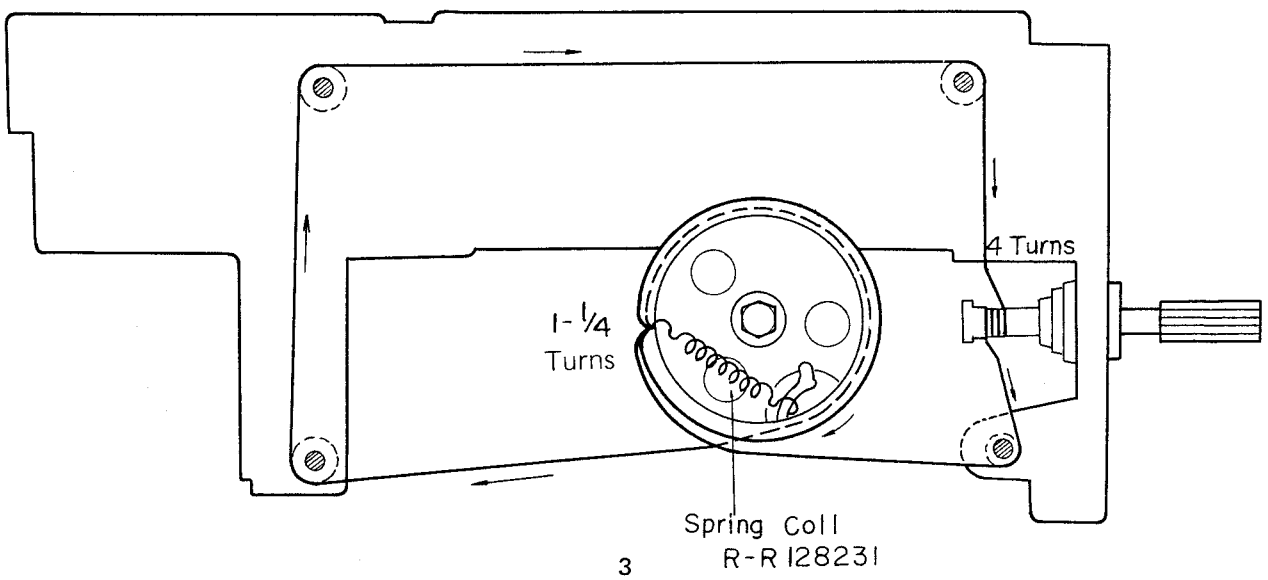


Fig. 8

Before adjustment of SVR-100K, Bias-trap coil (15mH) should be adjusted. Adjust Bias-trap coil by plastic screwdriver or equivalent through the adjustment. Hole on the printed circuit board so that the voltage across 10 ohm resistor will becomes maximum value. Then, adjust SVR-100K so that the voltage across 10 ohm resistor will be 0.45mV on the AC VTVM.

DIAL CORD STRINGING



TUNER ADJUSTMENT

MW ADJUSTMENT

Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	I. F. T.	Connect sweep generator to ANT. Terminal.	Connect oscilloscope to EXT. SP terminals	455 KHz (400 Hz 30% modulation)	Low end of dial scale. At position of no unrequired signal.	T6, T7 and T8	MAX.
2	O. S. C.	Connect AM SG to ANT. Terminal.	Connect VTVM to speaker terminals.	505 KHz (400 Hz 30% modulation)	Low end of dial scale	L11	MAX.
3				1650 KHz (400 Hz 30% modulation)	High end of dial scale	CT3	
4	ANT.	Connect AM SG to ANT. Terminal.	Connect VTVM to speaker terminals.	600 KHz (400 Hz 30% modulation)	600 KHz on dial scale	L12	MAX.
5				1400 KHz (400 Hz 30% modulation)	1400 KHz on dial scale	CT4	
6	Repeat adjustments.						

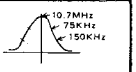
PREPARE:
1. Variable Capacitors completely closed.
2. Set the dial pointer to very left line of dial scale.
3. Connect sweep generator, AM SG, VTVM and oscilloscope.
4. Selector switch to "AM".
5. Use a screwdriver with plastic grip for all adjustments.

SW ADJUSTMENT

Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	O. S. C.	Connect AM SG. to ANT terminal through IRE dummy.	Connect VTVM to EXT. SP. terminals.	3.15 MHz (400 Hz 30% modulation)	Low end of dial scale.	L10	MAX.
2				12.5 MHz (400 Hz 30% modulation)	High end of dial scale.	CT5	
3	ANT.	Connect AM SG. to ANT terminal through IRE dummy.	Connect VTVM to EXT. SP. terminals.	3.5 MHz (400 Hz 30% modulation)	3.5 MHz on dial scale.	L7	MAX.
4				11.8 MHz (400 Hz 30% modulation)	11.8 MHz on dial scale.	CT6	
5	Repeat adjustments.						

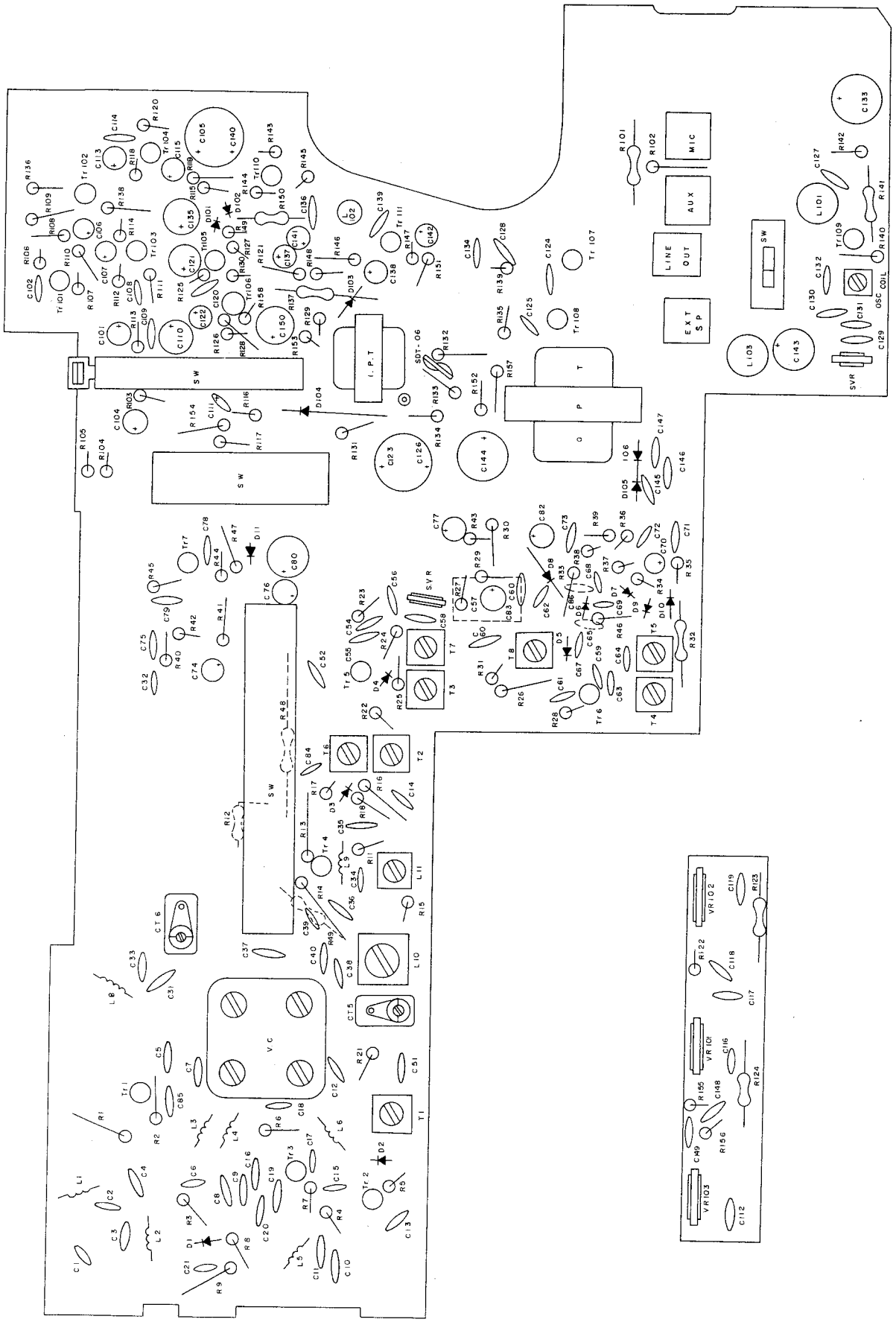
PREPARE:
1. Variable capacitor completely closed.
2. Set the dial pointer to very left line dial scale.
3. Connect signal generator to dummy antenna.
4. Use screwdriver with plastic glip for all adjustments.
5. Selector switch to "SW".

FM ADJUSTMENT

Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	I. F.	Connect sweep generator to FM ANT Terminal.	Connect oscilloscope to test point	10.7 MHz (0% modulation)	Near max. capacity of VC. at position with no unrequired signal.	T1 to T4	
2	Ratio Det.		Connect oscilloscope to test point			T5	
3	O. S. C.	Connect FM SG. to FM ANT. Terminals.	Connect VTVM to speaker terminal.	87 MHz (400 Hz 30% modulation)	Low end of dial scale	L6	Max.
4				109MHz (400 Hz 30% modulation)	High end of dial scale	CT1	
5	ANT.	Connect FM SG. to FM ANT. Terminals.	Connect VTVM to speaker terminal.	90 MHz (400 Hz 30% modulation)	90 MHz on dial scale	L3 and L4	Max.
6				109 MHz (400 Hz 30% modulation)	109 MHz on dial scale	CT2	
7	Repeat adjustments.						

PREPARE:
1. Variable Capacitors completely closed.
2. Set the dial pointer to very left line of dial scale.
3. Connect sweep generator, FM SG, VTVM and oscilloscope. FM antenna input impedance is 75 ohm.
4. Use a screwdriver with plastic grip for all adjustments.

PARTS LOCATION



PARTS LIST

Part No.	Description	Q'ty
PACKING		
141-6-132T-42800	Individual carton	1
141-6-144T-12700	Filler, plastic case	2
	Polyethylene bag 320 x 500mm, set	1
	Polyethylene bag 80 x 200mm, power supply cord	1
141 6-411T-41900	Instruction booklet	1
R-478419	Serial number label	1
	Polyethylene bag 180 x 250mm, instruction booklet	1
R-478391	Caution label, Voltage	1
141-6-415T-04500	Notice	1
141-2-182T-02600	Pouch, Compartment	1
	Polyethylene bag 120 x 300mm, Pouch	1
	Polyethylene bag 90 x 120mm, Adaptor	1
CABINET		
R-AT67301	Front Cabinet assembly	1
141-2-111T-15300	Cabinet	(1)
141-2-131T-06500	Clear window	1
141-2-151T-05400	Decorative panel, Right	1
141-2-151T-05500	Decorative panel, Left	1
141-2-143T-44200	Marking plate, Counter	1
141-2-152T-24101	Sash, Cabinet center	1
141-2-152T-26100	Sash, Lower part	1
141-2-152T-24400	Sash, Upper part	1
141-2-143T-46300	Marking plate, MIC	1
	Sheet 15 x 15mm, MIC	1
141-2-243T-04400	Base, VR	1
141-2-143T-44300	Marking plate, Base	1
	Rubber cushion 2 x 4 x 10mm	2
141-2-135T-23200	Cover	1
141-2-133T-05900	Compartment lid, Stereocast	1
141-2-143T-39800	Marking plate	1
	Sheet 12 x 25mm	1
141-2-171T-06000	Handle	1
141-2-135T-22800	Cover, Upper	1
141-2-135T-22900	Cover, Lower	1
141-2-271T-06701	Bracket, Handle	2
	Polyethylene washer 8.2 x 12 x 0.5mm	4
	Sheet 27 x 40mm	2
R-AT67302	Back lid assembly	1
141-2-126T-08800	Back lid	(1)
141-2-152T-24302	Sash	1
141-2-141T-31300	Rating plate	1
R-258137d	Battery Terminal (–), Lower	1
R-258136a	Battery Terminal (+), Upper	1
R-318394	Base, battery Terminal (+)	1
R-258151	Battery Terminal (+)	3
R-478552	Battery sheet	1
141-2-337T-01400	Ribbon, battery tack-up	1
R-12059a	Speed washer, Ribbon mtg.	1
	Veil 70 x 100mm	1
	Veil 20 x 60mm, Battery case	1
	Felt cushion 35 x 40 x 3mm, PT	1
	Rubber cushion 8 x 8 x 12mm	2
	Adhesive tape 12 x 50mm	5
	Adhesive tape 12 x 150mm	2
R-AT67303	Cassette lid assembly	1
141-2-124T-07500	Cassette lid	(1)
141-2-151T-07100	Decorative panel	1
141-2-853T-28200	Spring plate	2
141-2-751T-49801	Shaft	1
	Sheet 5 x 15mm	2
	Sheet 5mm	2
141-2-853T-29001	Spring plate	1
R-AT67304	Battery lid assembly	1
141-2-128T-04600	Battery lid	(1)
	Cushion 70 x 20 x 10mm	1
	Sheet 3 x 5mm	4
141-2-858T-05100	Bracket, Stepper spring	1
141-2-852T-18401	Spring wire	1
141-2-161T-13401	Push button, Dial light	1
141-2-262T-02100	Bracket, Push button knob	1
R-118562	Fixer, Speaker lower	1
R-113377	Fixer, Speaker upper	1
R-S3165	Lug, Lead retainer	1
R-23676	Lug, Rod antenna terminal	1

Part No.	Description	Q'ty
141-0-163T-03400	Rotary konb assembly, Volume, Bass, Treble	3
141-0-163T-03500	Rotary knob assembly, Tuning	1
141-2-153T-14600	Escutcheon, Cassette lid	1
141-2-135T-24001	Cover, Head	1
	Ethylene washer 9 x 14 x 0.5mm, Rotary knob	3
CHASSIS		
141-2-367T-17100	Bracket, Jack mtg.	1
141-2-143T-39901	Marking plate	1
R-398164	Cover, beat cancel	1
	Fiber washer 3.3 x 8 x 0.5mm, Bracket mtg.	1
R-261416	Holder, Antenna mtg.	1
	Rubber cushion 30 x 15 x 0.8mm, Antenna mtg.	2
R-44065	Cushion, VC mtg.	1
141-2-752T-11302	Post pin, Band selector lever mtg.	1
141-2-741T-45901	Lever, Band selector steel lever	1
141-2-741T-46001	Lever, Band selector bakelite lever	1
141-2-741T-46101	Lever, Band selector AS grass fiber lever	1
141-2-681T-02200	Sleeve, Band selector lever	2
	Spacer 2.5 x 4 x 2.1mm	1
141-2-311T-11300	Chassis	1
141-2-747T-04700	Bracket, VU/Batt lever knob	1
141-2-747T-04900	Bracket, Band selector Radio ON/OFF	2
R-AT67305	Lever knob assembly	3
141-2-162T-06001	Lever	3
141-2-156T-03700	Cup	3
141-2-851T-60101	Spring coil, Lever knob	2
141-2-851T-61800	Spring coil, Lever knob	1
	Fiber washer 2.1 x 8 x 0.5mm, Joint mtg.	1
141-2-253T-02301	Joint, VU/Batt change	1
141-2-751T-52101	Shaft, Lever knob mtg.	3
141-2-741T-46200	Lever, Radio ON/OFF AS grass fiber lever	1
141-2-741T-46300	Lever, Radio ON/OFF steel lever	1
	Spacer 2.5 x 4 x 2.1mm, Lever mtg.	2
	Fiber washer 3.3 x 8 x 0.5mm, Band selector lever	1
	Fiber washer 2.5 x 5 x 1mm, Radio ON/OFF lever	1
	Steel ball 1/8" (3.2mm), Lever knob	3
123-2-566T-02400	Tuning shaft	1
141-2-661T-15900	Pulley, Rope	4
R-39451	Drum	1
R-S7083	Special screw, Drum stopper	1
R-128231	Spring coil, Rope tension	1
	Rope 600 x 0.3mm	1
	Fiber washer 2.1 x 5 x 0.5mm	4
141-2-374T-06700	Bracket, Pilot lamp mtg.	1
141-2-365T-17800	Bracket, Dial rope spring switch mtg.	1
123-0-511T-01900	Pointer assembly	1
123-2-146T-07100	Dial scale, Chassis	1
141-2-741T-46400	Lever, REC	1
141-2-253T-02202	Joint, REC	1
141-2-367T-17201	Bracket, Stereocast socket	1
141-2-385T-01300	Bracket, MIC mtg.	1
141-2-365T-18000	Bracket, MIC switch mtg.	1
141-2 156T-03700	Cup, MIC switch knob	1
141-2-446T-04400	Plastic cushion, Meter	1
141-2-157T-16400	Inlay, Reflector of cassette	1
141-2-241T-10900	Veil, MIC switch	1
R-S3063	Lug	1
R-S3165	Lug, Lead retainer	1
	Sheet, Double face 10 x 35mm, VU meter	1
	Fiber washer 3.3 x 8 x 0.5mm, P.C.B. mtg.	4
	Rubber cushion 5 x 5 x 10mm, Lead retainer	1
141-2-322T-18600	Shield plate, P.C.B.	1
141-2-851T-60700	Spring coil, Capacitor mtg.	1
141-2-135T-25300	Cover, Voltage select socket	1
141-2-241T-12000	Veil, Slide switch	1
R-128229	Lug, Lead retainer	1

NOTES: 1. Parts orders must contain Model Number, Part Number and Description.
2. Unless otherwise noted, component parts indicated by parentheses in the column Q'ty are not available.
3. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

PARTS LIST

Ref. No.	Part No.	Description	Q'ty
ELECTRICAL PARTS			
		AUDIO SECTION	
	4-251T-25200	Power transformer	1
VR103	4-222T-27000	Variable resistor 50 KA, Volume	1
	4-151T-09400	Speaker 10cm 8 ohm	1
VR101,102	4-222T-25600	Variable resistor 50 KA, Bass Treble	2
	4-511T-03900	Meter	1
	4-258T-06200	OSC coil	1
	4-153T-06500	Microphone	1
	4-254T-10200	Output transformer	1
	R-W6859	Input transformer	1
L101	R-W1819	Choke coil 15 mH. Trap	1
L102	4-253T-04200	Choke coil 6.8 mH, Pri-emphasis	1
L103	R-W1855	Choke coil 100μH, Motor	1
	R-R11011	Semi variable resistor, Bias	1
	4-231T-32800	Slide switch S111-S116	1
	R-S88682	Cassette	1
	4-235T-14600	Socket, Voltage change } or	1
	4-236T-03800	Plug, Voltage change }	1
	R-S2133a	Socket, Voltage change } or	1
	R-S1227	Plug, Voltage change }	1
	4-231T-21901	Slide switch, R/P S101 – S106	1
	4-231T-14900	Slide switch, Beat switch S131	1
	4-231T-15300	Slide switch, MIC ON/OFF S121 – S122	1
	R-S4822	Slide switch, VU/Batt S132	1
	4-231T-23601	Spring switch, Pilot lamp S136	1
	141-2-382T-00600	Terminal	8
	R-S2863	Socket, MIC AUX SP Line out	4
	R-S2839a	Socket, Remote	1
	R-S2924	Socket, Car battery	1
	R-261193a	Heat sink, Power Transistor	1
	4-612T-02707	Pilot lamp, Dial illuminate	1
	R-S3863	Lug plate	1
	R-S3063	Lug	1
	R-128178	Lug, VR earth	3
	4-231T-36000	Spring switch, S137	1
	R-AT67306	Printed circuit board assembly	1
Tr101		Transistor 2SC858	1
Tr102,103 104,105 106,110 111		Transistor 2SC945	7
Tr107,108		Transistor 2SB405	2
Tr109		Transistor 2SB185	1
D101,102 103,104		Diode 1S188	4
D105		Diode DS-131	1
		Thermistor SDT-06	1
	R-S8574b	Adaptor assembly, Siemense 2 pin type	1
	R-S8575b	Adaptor assembly, England 2 pin type	1
	4-243T-73600	Power supply cord assembly, 250V	1
	4-235T-17400	Socket	1
	141-2-327T-09500	Insulator	1
		TUNER SECTION	
L7	4-257T-04000	ANT coil	1
L1	4-265R-00400	VHF coil R-W9011a	1
L2	4-265R-05000	VHF coil R-W9018a	1
L3,4	4-265R-13600	VHF coil	2
L5	4-265R-12700	VHF coil R-W9016	1
L6	4-265R-12400	VHF coil R-W9089	1
L8	4-265R-11200	VHF coil R-W9063	1
L9	4-253R-11160	RF choke 1μH ±10% R-W1055A-6	1
L10	R-W8548-4	OSC coil, SW	1
L11	4-258T-06400	OSC coil, MW	1
	4-224T-04600	Variable capacitor 20p – 335pF	1
	4-224R-01400	Trimmer R-C0057	2
T1	R-W5T297-4	IFT, FM	1
T2,3	R-W5T825-4	IFT, FM	2
T4	4-256T-04800	IFT, FM	1
T5	4-256T-04000	IFT, FM R-W5T310-4	1
T6,7	4-256T-04100	IFT, AM R-W5T311-4	2

Ref. No.	Part No.	Description	Q'ty
ELECTRICAL PARTS			
T8	4-256T-03700	IFT, AM R-W5T312-4	1
	4-222R-00400	Variable resistor 50 KB R-R11010	1
	4-231T-33100	Slide switch, Band select	1
	4-244T-00801	Telescopic antenna	1
	123-2-382R-00200	Terminal R-S3232	9
	4-235R-16500	Socket, Stereocast	1
	R-AT67307	Printed circuit board assembly	1
Tr1,2		Transistor 2SC930	2
Tr3		Transistor 2SC772	1
Tr4		Transistor 2SC929	1
Tr5,6		Transistor 2SC930	2
Tr7		Transistor 2SA628	1
D1		Diode 1S553	1
D2,4		Diode DS-442	2
D3,5,6, 7,8		Diode 1S188 AM	5
D9,10		Diode 1S188 FM-1	2
D11		Diode 1S330 A1	1
CAPACITORS			
		AUDIO SECTION	
C101,106	R-C9986	Alox or Alsicon 1μF 16V	2
C102,129		Ceramic disk type 470pF ±20% 50WV	2
C103		Electrolytic 0.22μF 16V	1
C104		Alox or Alsicon 0.33μF 16V	1
C105,140		Electrolytic 470μF Block 6.3V	1
C107,138 142		Electrolytic 2.2μF 25V	3
C108,114		Ceramic disk type 0.001μF ±20% 50WV	2
C109		Mylar square type 0.33μF ±20% 50WV	1
C110,115 121,137 141	R-C9883	Electrolytic 4.7μF 16V	5
C111		Mylar 0.022μF ±20% 50WV	1
C112,116		Ceramic disk type 0.0033μF ±20% 50WV	2
C113		Electrolytic 1μF 25V	1
C117,132, 149		Mylar square type 0.047μF ±20% 50WV	3
C118,119		Mylar square type 0.068μF ±20% 50WV	2
C120		Ceramic disk type 220pF ±20% 50WV	1
C122		Alox or Alsicon 0.22μF 16V	1
C123,126		Electrolytic 470μF Block 10V	1
C124,125		Ceramic disk type 0.01μF +80% –20% 50WV	2
C127,131		Mylar square type 0.0015μF ±10% 50WV	2
C128,148		Ceramic disk type 0.0047μF ±20% 50WV	2
C130		Ceramic square type 150pF ±20% 50WV	1
C133	R-C9932	Electrolytic 330μF 6.3V	1
C134		Ceramic disk type 0.0068μF ±20% 50WV	1
C135,150	R-C9875	Electrolytic 220μF 6.3V	2
C136		Mylar square type 0.082μF ±20% 50WV	1
C139		Ceramic disk type 0.05μF +80% –20% 25WV	1
C143	R-C9879	Electrolytic 220μF 10V	1
C144	R-C9935	Electrolytic 1000μF 10V	1
C145,146 147		Ceramic disk type 0.02μF +80% –20% 50WV	3
C151	R-C9930	Electrolytic 2200μF 10V	1
C152	R-C9935	Electrolytic 1000μF 10V	1

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3. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

PARTS LIST

Ref. No.	Part No.	Description	Q'ty
CAPACITORS			
		TUNER SECTION	
C1,15 85		Ceramic disk or square type 0.001μF ±20% 50V	3
C 2,40		Ceramic disk or square type 20pF ±10% 50V	2
C3,11		Ceramic disk or square type 8pF ±0.5pF 50V	2
C4		Ceramic disk or square type 47pF ±10% 50V	1
C5,6 13,16 51		Ceramic disk or square type 0.01μF +80% −20% 25 or 50V	5
C7		Ceramic disk or square type 22pF ±10% 50V	1
C8, 31 38		Ceramic disk or square type 4pF ±0.5pF 50V	3
C9, 12 52,58 61,68 78,79		Ceramic disk or square type 0.02μF +80% −20% 25 or 50V	8
C10		Ceramic disk or square type 470pF ±20% 50V	1
C14,21 54,56 69,73		Mylar square type 0.022μF ±20% 50V	6
C17,20 64		Ceramic disk or square type 5pF ±0.5pF 50V	3
C18		Ceramic disk or square type 16pF ±10% 50V	1
C19,55 60		Ceramic disk or square type 2pF ±0.5pF 50V	3
C32		Ceramic disk or square type 10pF ±10% 50V	1
C33		Mylar square type 0.0047μF ±20% 50V	1
C34		Mylar square type 0.0022μF ±20% 50V	1
C35,65 66,84		Mylar square type 0.01μF ±20% 50V	4
C36		Mylar square type 0.0033μF ±20% 50V	1
C37		Styrol cylinder type 1800pF ±5% 50V	1
C39		Styrol cylinder type 350pF ±5% 50V	1
C57,70 82	R-C9883	Electrolytic 4.7μF 16V	3
C59		Ceramic disk or square type 1pF ±0.5pF 50V	1
C62,86		Ceramic disk or square type 0.04μF +80% −20% 25 or 50V	2
C63		Ceramic disk or square type 33pF ±5% 50V	1
C67		Ceramic disk or square type 100pF ±10% 50V	1
C71,72		Ceramic disk or square type 220pF ±20% 50V	2
C74,76	R-C9126	Electrolytic 0.1μF 10V	2
C75		Myar square type 0.04μF ±20% 50V	1
C77	R-C9115	Electrolytic 1μF 10V	1
C80	R-C9932	Electrolytic 330μF 6.3V	1
C83	R-C9875	Electrolytic 220μF 6.3V	1
RESISTORS			
		AUDIO SECTION	
R101		Carbon P 120KΩ ±10% 1/4W	1
R102		Carbon P 680Ω ±10% 1/4W	1
R103		Carbon P 10Ω ±10% 1/4W	1
R104,115 151,159		Carbon P 1KΩ ±10% 1/4W	4
R105,152		Carbon P 33KΩ ±10% 1/4W	2
R106		Carbon P 15KΩ ±10% 1/4W	1
R107		Carbon P 2.2MΩ ±10% 1/4W	1
R108		Carbon P 47Ω ±10% 1/4W	1
R109,113 117		Carbon P 100KΩ ±10% 1/4W	3
R110,129 138,139		Carbon P 5.6KΩ ±10% 1/4W	4
R111,143		Carbon P 330KΩ ±10% 1/4W	2
R112,125		Carbon P 560KΩ ±10% 1/4W	2

Ref. No.	Part No.	Description	Q'ty
RESISTORS			
R114,140 146		Carbon P 10KΩ ±10% 1/4W	3
R116,147		Carbon P 68KΩ ±10% 1/4W	2
R118		Carbon P 150KΩ ±10% 1/4W	1
R119,133		Carbon P 1.2KΩ ±10% 1/4W	2
R120		Carbon P 100Ω ±10% 1/4W	1
R121,148		Carbon P 560Ω ±10% 1/4W	2
R122,124		Carbon P 4.7KΩ ±10% 1/4W	2
R123		Carbon P 3.3KΩ ±10% 1/4W	1
R126,144		Carbon P 3.9KΩ ±10% 1/4W	2
R127		Carbon P 270Ω ±10% 1/4W	1
R128		Carbon P 47KΩ ±10% 1/4W	1
R130		Carbon P 3.3Ω ±10% 1/4W	1
R131,137		Carbon P 120Ω ±10% 1/4W	2
R132		Carbon P 56Ω ±10% 1/4W	1
R134		Carbon P 33Ω ±10% 1/4W	1
R135		Carbon P or Solid 1Ω ±10% 1/2W	1
R136		Carbon P 27Ω ±10% 1/4W	1
R141,142		Carbon P 22Ω ±10% 1/4W	2
R145,150		Carbon P 1.5KΩ ±10% 1/4W	2
R149		Carbon P 2.2KΩ ±10% 1/4W	1
R153		Carbon P 220Ω ±10% 1/4W	1
R154		Carbon P 56KΩ ±10% 1/4W	1
R155		Carbon P 1.8KΩ ±10% 1/4W	1
R156		Carbon P 22KΩ ±10% 1/4W	1
R157		Carbon P or Solid 15Ω ±10% 1/2W	1
R158		Carbon P 18KΩ ±10% 1/4W	1
		TUNER SECTION	
R1		Carbon P 1KΩ ±10% 1/4W	1
R2		Carbon P 180KΩ ±10% 1/4W	1
R3,5 33,34 35,39		Carbon P 1KΩ ±10% 1/4W	6
R4		Carbon P 390KΩ ±10% 1/4W	1
R6,11		Carbon P 2.2KΩ ±10% 1/4W	2
R7		Carbon P 220KΩ ±10% 1/4W	1
R8,9		Carbon P 100KΩ ±10% 1/4W	2
R12		Carbon P 2.2MΩ ±10% 1/4W	1
R13		Carbon P 1.2MΩ ±10% 1/4W	1
R14		Carbon P 820Ω ±10% 1/4W	1
R15,16		Carbon P 100Ω ±10% 1/4W	2
R17,29		Carbon P 10KΩ ±10% 1/4W	2
R18		Carbon P 150KΩ ±10% 1/4W	1
R21		Carbon P 120KΩ ±10% 1/4W	1
R22		Carbon P 33Ω ±10% 1/4W	1
R23		Carbon P 560Ω ±10% 1/4W	1
R24		Carbon P 470KΩ ±10% 1/4W	1
R25		Carbon P 180Ω ±10% 1/4W	1
R26		Carbon P 33Ω ±10% 1/4W	1
R27,43		Carbon P 8.2KΩ ±10% 1/4W	2
R28		Carbon P 1.2KΩ ±10% 1/4W	1
R30		Carbon P 10KΩ ±10% 1/4W	1
R31,32		Carbon P 270Ω ±10% 1/4W	2
R36,37 41		Carbon P 5.6KΩ ±10% 1/4W	3
R38		Carbon P 1MΩ ±10% 1/4W	1
R40		Carbon P 3.9KΩ ±10% 1/4W	1
R42		Carbon P 1.2KΩ ±10% 1/4W	1
R44		Carbon P 82Ω ±10% 1/4W	1
R45		Carbon P 18KΩ ±10% 1/4W	1
R46		Carbon P 6.8KΩ ±10% 1/4W	1
R47		Carbon P 27Ω ±10% 1/4W	1
R48		Carbon P 27KΩ ±10% 1/4W	1
R49		Carbon P 470Ω ±10% 1/4W	1
SCREW MOUNTING			
		Screw, Pan head 2 x 4mm	2
		Screw, Pan head 2 x 6mm	6
		Screw, Pan head 2.6 x 4mm	4
		Screw, Pan head 2.6 x 6mm	3
		Screw, Pan head 2.6 x 8mm	1
		Screw, Pan head 3 x 6mm	4
		Screw, Pan head 3 x 8mm	7
		Screw, Tapping 2.3 x 4mm	2
		Screw, Tapping 2.3 x 6mm	3

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PARTS LIST

Ref. No.	Part No.	Description	Q'ty
SCREW MOUNTING			
		Screw, Tapping 2.3 x 8mm	3
		Screw, Tapping 3 x 6mm	6
		Screw, Tapping 3 x 8mm	6
		Screw, Tapping 3 x 10mm	5
		Screw, Tapping 3 x 16mm	3
		Screw, Tapping 3 x 20mm	3
		Screw, Tapping 3 x 35mm	2
		Screw, Tapping 3 x 30mm	1
		Screw, Flat tapping 3 x 8mm	1
		Regular hexagon bolt 3mm	2
		Regular hexagon bolt 3 x 8mm	2
		Nut 2mm	1
		Nut 2.6mm	1
		Nut 3mm	3
		Washer 2mm	5
		Washer 2mm	4
		Washer 2.6mm	1
		Washer 2.6 x 8 x 0.5mm	1
		Washer 2.9 x 7.5 x 0.5mm	2
		Washer 3.3 x 8 x 0.5mm	2
		Washer 3.3 x 13 x 1mm	1
		Washer 6.5 x 13 x 1mm	2
		Washer, Spring 3mm	4
		External tooth lock washer 2mm	1
		External tooth lock washer 3mm	6
		External "E" ring 2mm	1
MECHANISM			
1	141-2-311T-11500	Chassis	1
2	141-2-853T-27100	Spring plate, Cassette pressure	1
3	4-231T-31800	Spring swithc	1
4	141-2-731T-18900	Slide, Stop	1
5	141-0-731T-04800	Slide assembly, Eject	1
8	141-2-851T-57400	Spring coil, Stop	1
10	141-0-853T-00100	Spring plate assembly, Play push up	1
11	141-2-714T-02000	Bracket, Brake	1
12	141-2-712T-01700	Brake shoe	1
13	123-2-472R-00400	Lug, Hook the spring of brake returning	2
14	141-2-741T-48300	Lever, Eject	1
15	141-2-851T-56100	Spring coil, Eject	1
16	R-S3018	Eyelet	2
17	141-2-811T-02500	Counter	1
18	141-2-661T-17100	Pulley, Relay	1
19	141-2-457T-04100	Special washer, Pulley mtg.	1
20	141-2-564T-09900	Square belt, Counter drive	1
21	141-2-564T-10000	Square belt, Counter relay	1
22	141-0-521T-02201	Flywheel assembly	1
24	141-2-524T-04801	Bracket, Flywheel	1
25	141-2-573T-02901	Shaft bracket, Flywheel	1
26	141-2-457T-04300	Special washer, Flywheel prevent the oil up	1
27	R-S3165	Lug, Flywheel bracket Motor	3
28	141-2-564T-10500	Square belt, Main	1
29	141-2-562T-03300	Take up belt	1
31	R-128276	Spring coil, Brake bracket returning	1
32	141-0-731T-04301	Slide assembly, Head	1
33		Steel ball, Head slide accept	5
34	114-2-853T-26400	Spring plate, Head slide pressure	1
35	141-2-851T-57400	Spring coil, Head slide returning	1
36	141-0-545T-00700	Lever pinch roller assembly	1
37	141-2-851T-55300	Spring coil, Pinch lever pressure	1
38	141-0-721T-00400	Lever shut off assembly, Auto stop	1
39	4-242T-08102	R/P head	1
40	4-242T-08200	E head	1
41	141-2-464T-09300	Fixer, Head mtg.	1
42	141-2-851T-59500	Spring coil, R/P head mtg.	1
43	R-128229	Lug, Head lead retainer	2
44	141-2-731T-21201	Slide, Play	1
45	R-23439	Lug, R/P head earth	1
46	141-2-531T-07900	Reel plate, Supply	1
47	141-0-661T-00900	Pulley assembly, REW	1
48	141-2-531T-07800	Reel plate, Take up	1
49	141-2-661T-15201	Pulley, Take up	1
50	141-2-452T-00901	Felt washer, Take up slip	1
51	141-2-661T-16102	Pulley, FWD	1
52	141-2-457T-06200	Special washer, Right reel plate	1
53	141-0-731T-04500	Slide assembly, FWD	1

Ref. No.	Part No.	Description	Q'ty
MECHANISM			
54	141-2-851T-57500	Spring coil, FWD slide returning	1
55	141-2-731T-18700	Slide, REW	1
56	141-2-851T-57400	Spring coil, REW slide returning	1
57	141-2-731T-21500	Slide, REW reverse	1
58	141-2-741T-43000	Lever, FWD pressure	1
59	141-2-851T-56400	Spring coil, FWD pressure	1
60	141-2-741T-43100	Lever, REW reverse	1
61	141-0-731T-04400	Slide assembly, FWD roller	1
62	141-2-662T-07101	Roller, FWD	1
63	141-2-457T-04100	Special washer, Roller stopper	2
64	141-0-741T-06000	Lever assembly, REW roller	1
65	141-2-661T-14900	Pulley, REW roller	1
66	141-2-851T-57200	Spring coil, REW roller lever returning	1
67	141-2-851T-57200	Spring coil, FWD roller slide returning	1
68	141-2-457T-04400	Special washer, FWD roller slide	1
69	R-24670	Ring, FWD roller slide	1
70	141-2-462T-25500	Boss, FWD roller slide mtg.	1
71	141-2-731T-18500	Slide, Record	1
72	141-2-851T-57300	Spring coil, REC slide returning	1
73	141-2-741T-48400	Lever, Prevent the miss record	1
74	141-2-851T-56100	Spring coil, Prevent the miss record lever	1
75	4-527T-04900	DC motor	1
76	141-2-322T-19200	Shield plate, Motor mtg.	1
77	R-44045	Rubber cushion, Motor	1
78	141-2-421T-08300	Order screw, Motor mtg.	2
79	141-2-661T-65700 141-2-661T-65701 141-2-661T-65703	or Pulley, Motor	1
80	141-2-378T-05101	Bracket, Motor	1
81	141-2-445T-11800	Rubber cushion, Motor	1
82	R-AM26902 141-2-161T-12800 141-2-157T-14800	Push button assembly, etc. REC. Push button Inlay	4 (4) 4
83	R-AM26903 141-2-161T-12800 141-2-157T-14801	Push button assembly, REC. Push button Inlay, Record	1 (1) 1
84	141-2-737T-02100	Bracket, Lock slide mtg.	1
85	141-0-731T-04900	Slide assembly, Lock slide	1
86	141-2-851T-55400	Spring coil, Lock & Memory slide returning	2
87	141-2-851T-59700	Spring coil, Auto stop	1
88	141-2-731T-17700	Slide, Memory	1
89	141-2-715T-04600	Brake lever	1
90	141-2-465T-10100	Stopper, Lock slide	1
91	R-S3008	Lug, Brake earth	1
92	141-2-472T-03700	Lug, Motor mtg.	1
MECHANISM SCREW			
Y 1		Screw, Pan head 2 x 8mm	1
Y 2		Screw, Pan head 2 x 10mm	4
Y 3		Screw, Pan head 2.6 x 4mm	1
Y 4		Screw, Pan head 3 x 8mm	1
Y 5		Screw, Pan head 3 x 10mm	1
Y 6		Screw, Flat head 2.6 x 8mm	2
Y 7		Screw, Headless 2 x 4mm	1
Y 8		Screw, Tapping 2.3 x 4mm	3
Y 9		Screw, Tapping 2.3 x 6mm	2
Y11		Screw, Tapping 3 x 6mm	4
Y12		Screw, Tapping 3 x 8mm	8
Y14		Screw, Flat tapping 3 x 6mm	2
Y15		Regular hexagon bolt 3 x 6mm	1
Y16		Nut 2mm	2
Y17		Nut 3mm	1
Y18		Washer 3 x 8 x 0.5mm	5
Y19		Washer 3 x 10 x 0.5mm	1
Y20		Washer 5 x 10 x 0.8mm	1
Y21		Washer 3 x 10 x 1mm	4
Y22		Washer 3 x 13 x 1mm	1
Y23		Washer, Spring 2mm	3
Y24		Washer, Spring 2.6mm	1
Y25		Washer, Spring 3mm	2
Y26		Internal tooth lock washer 2.6mm	1
Y27		External "E" ring 1.2mm	2
Y28		External "E" ring 2mm	1
Y29		External "E" ring 4mm	1
Y30		Graphite nylon washer 2.1 x 4 x 0.25mm	6

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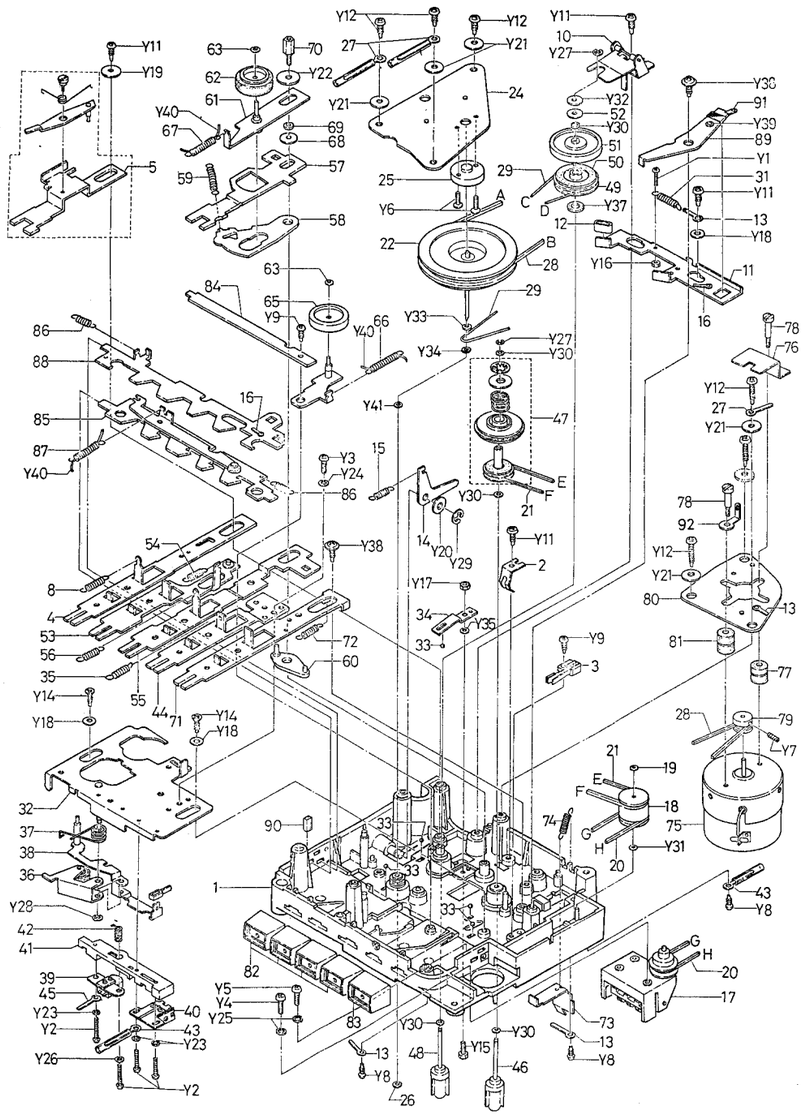
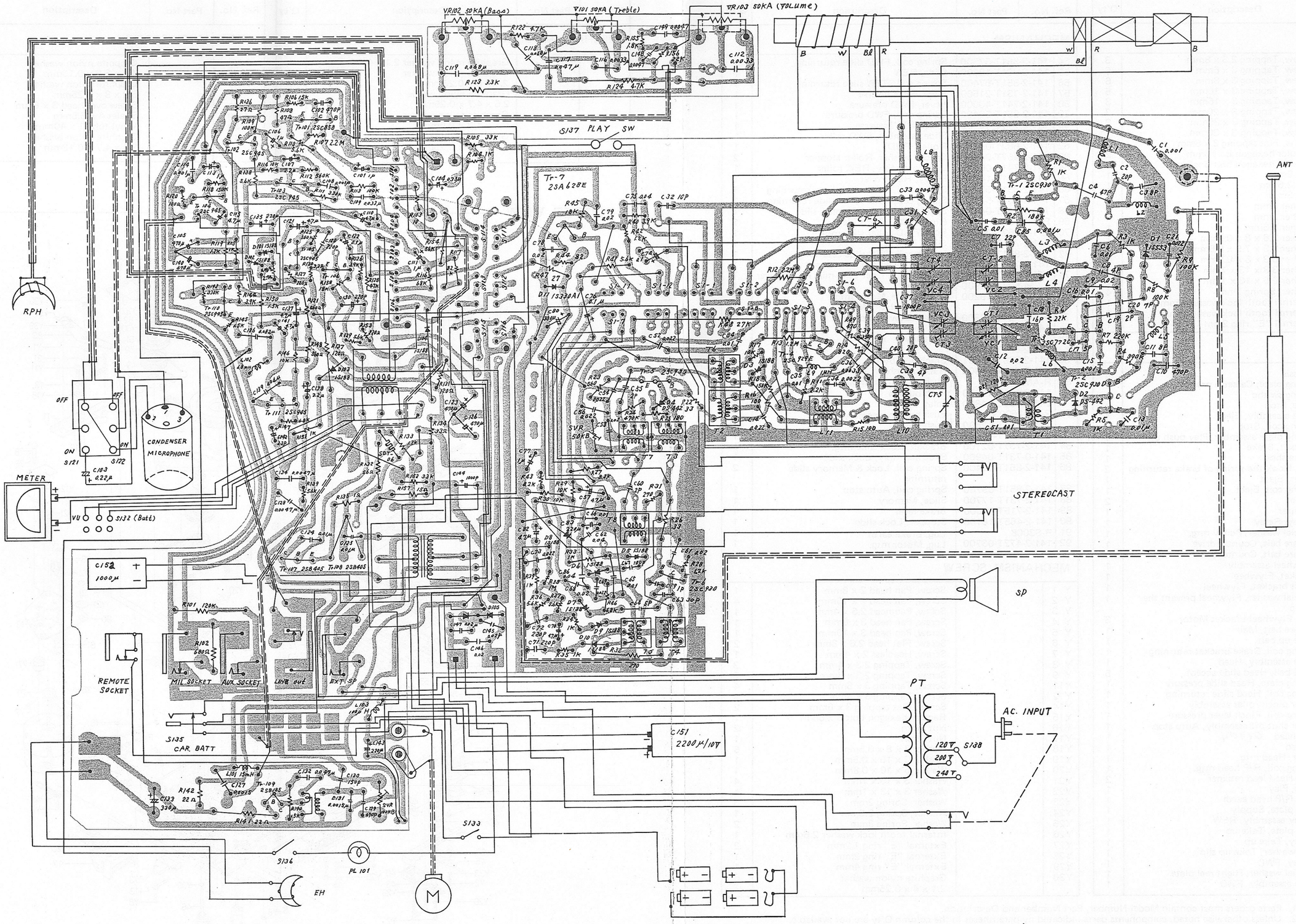
PARTS LIST

Ref. No.	Part No.	Description	Q'ty
MECHANISM SCREW			
Y31		Graphite nylon washer 2.1 x 4 x 0.5mm	1
Y32		Graphite nylon washer 2.1 x 8 x 0.25mm	1
Y33		Graphite nylon washer 2.6 x 4.7 x 0.25mm	1
Y34		Graphite nylon washer 2.6 x 4.7 x 0.5mm	1
Y35		Graphite nylon washer 3.1 x 5.4 x 0.25mm	2

Ref. No.	Part No.	Description	Q'ty
MECHANISM SCREW			
Y36		Graphite nylon washer 4.2 x 6.5 x 0.13mm	1
Y37		Graphite nylon washer 5.2 x 8 x 0.25mm	1
Y38		Screw over head 3 x 6mm	2
Y39		Eyelet 4 x 3.5mm	2
Y40		Vinyl tube 1 x 40mm	3
Y41		Graphite nylon washer 2.6 x 4.7 x 0.13mm	1

EXPLODED VIEW




VR102 50KA (Bass)
VR101 50KA (Treble)
VR103 50KA (VOLUME)
S137 PLAY SW
Tr-7 2SA628E
RPH
OFF
ON
S121
S122
CONDENSER MICROPHONE
METER
VU
S132 (Batt)
C152 1000μ
REMOTE SOCKET
MIC SOCKET
AUX SOCKET
LINE out
EXT SP
S135 CAR. BATT
S136
PL 101
EH
M
S133
C151 2200μ/10V
PT
AC. INPUT
120V
200V
240V
S138
STEREOCAST
SP
ANT
Tr-1 2SC930
Tr-2 2SC930
Tr-3 2SC930
Tr-4 2SC930
Tr-5 2SC772G
Tr-6 2SC930
Tr-7 2SA628E
Tr-101 2SC858
Tr-102 2SC945
Tr-103 2SC945
Tr-104 2SC945
Tr-105 2SC945
Tr-106 2SC945
Tr-107 2SB405
Tr-108 2SB405
Tr-109 2SB405
Tr-110 2SC945
Tr-111 2SC945
D1 1S553
D2 DS-442
D3 1S188
D4 1S188
D5 1S188
D6 1S188
D7 1S188
D8 1S188
D9 1S188
D10 1S188
D11 1S1588
D101 1S188
D102 1S188
D103 1S188
D104 1S188
D105 1S188
D131 0.0015μ
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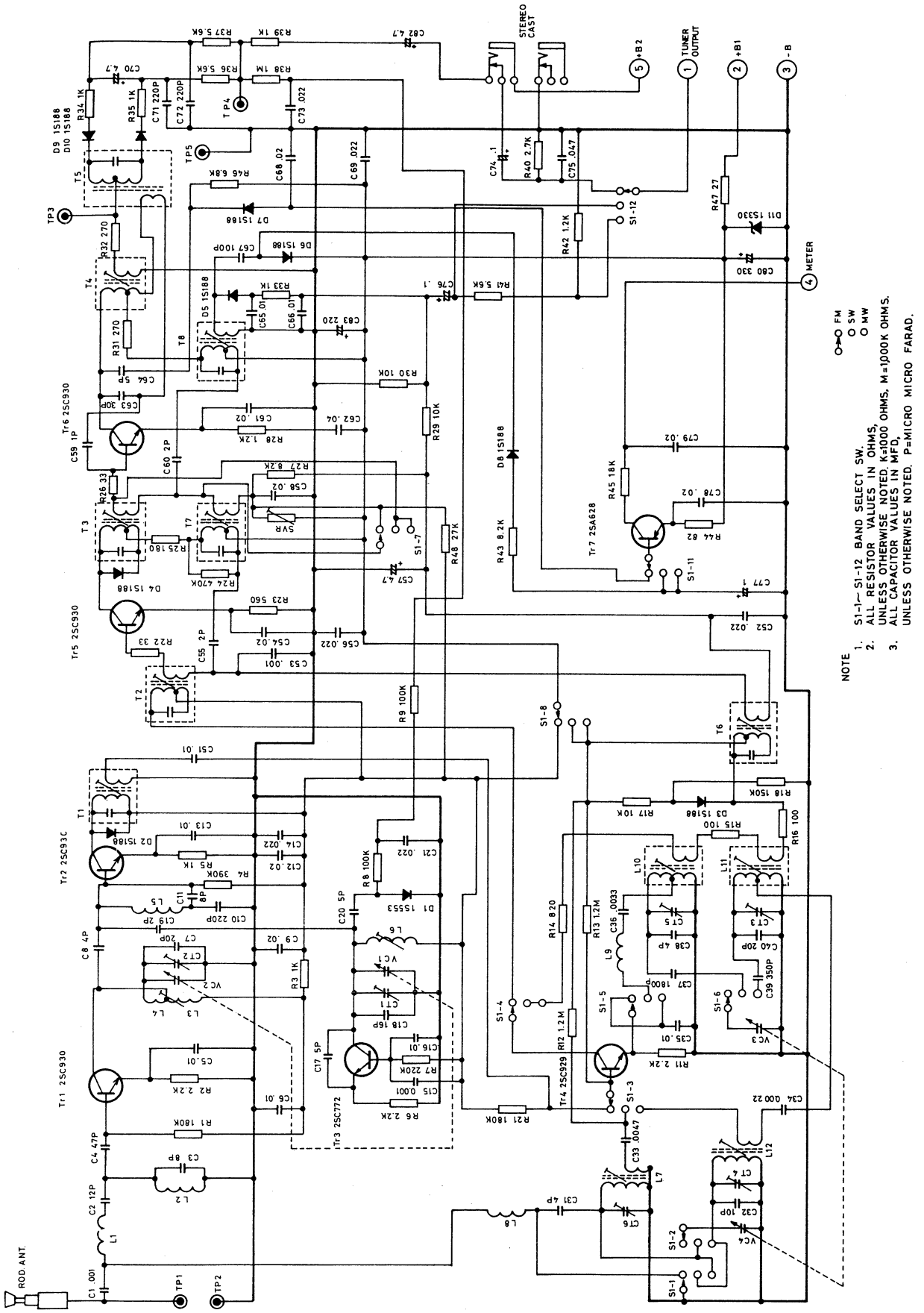
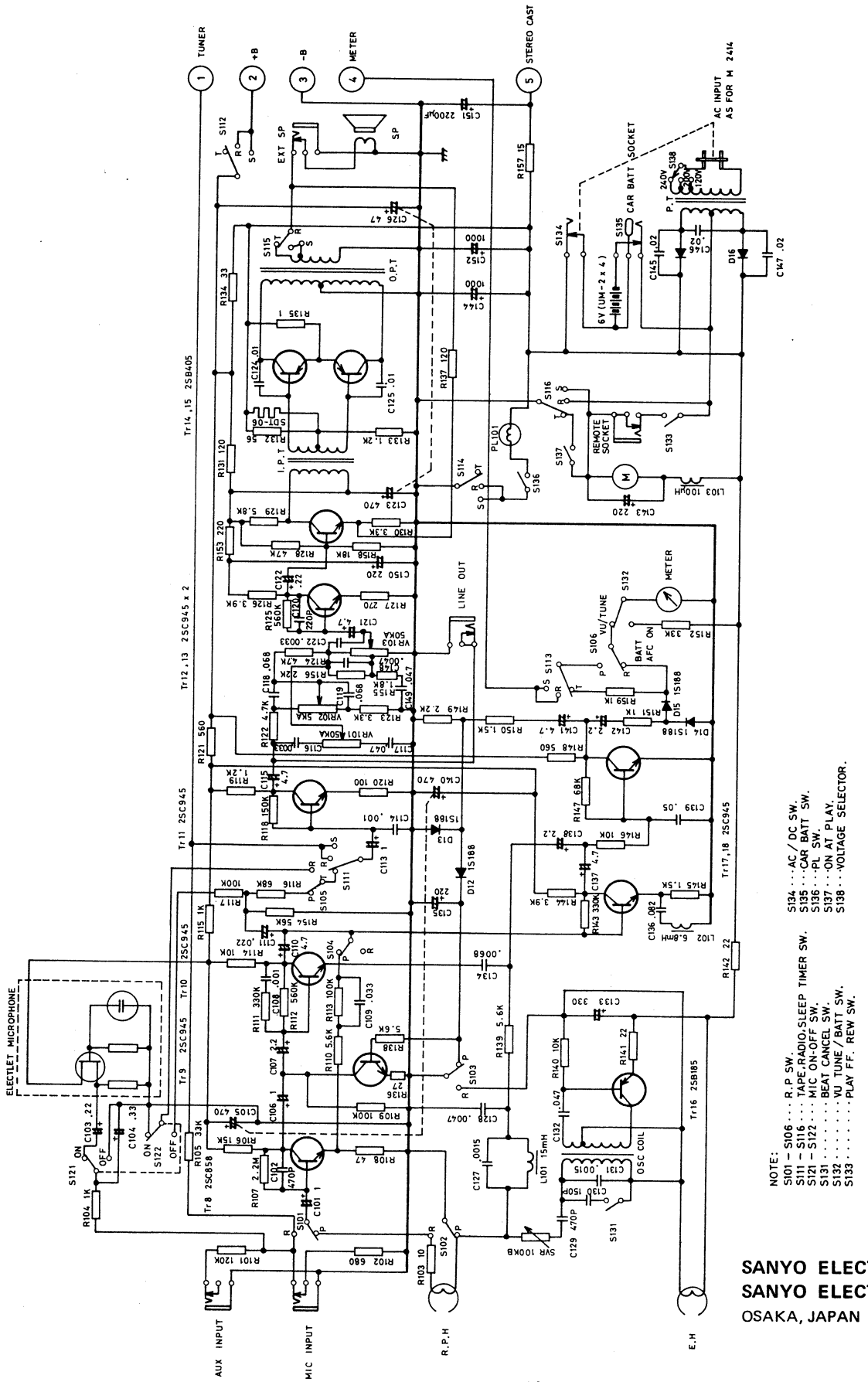
SCHEMATIC DIAGRAM (TUNER)



SCHEMATIC DIAGRAM (AUDED)



NOTE:
S101 – S106 · · · R.P SW.
S111 – S116 · · · TAPE,RADIO,SLEEP TIMER SW.
S121 – S122 · · · MIC ON-OFF SW.
S131 · · · · · · · BEAT CANCEL SW.
S132 · · · · · · · VU TUNE / BATT. SW.
S133 · · · · · · · PLAY FF. REW SW.

S134 · · · AC / DC SW.
S135 · · · CAR BATT SW.
S136 · · · PL SW.
S137 · · · ON AT PLAY.
S138 · · · VOLTAGE SELECTOR.

SANYO ELECTRIC TRADING CO., LTD.
SANYO ELECTRIC CO., LTD.
OSAKA, JAPAN

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